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ABSTRACT

Based on the premise that what students know before they read an assignment will strongly influence what they learn by reading that assignment, this booklet provides strategies that teachers can use to evoke and enhance students' background knowledge in relation to content area reading. Following a foreword and preface, the first major section of the booklet discusses readiness to read in the content areas, including content and word knowledge, motivation, and attention. The second section provides guidelines for asking and answering questions before reading. The third section contains information on forecasting a passage, while the fourth section discusses preteaching content vocabulary. Previewing graphically represented information is discussed in the fifth section. The sixth and final section covers guidelines for selecting prereading activities, keeping in mind the characteristics of the learners and materials and the expected learning goals. (HTH)

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reading aids series

Prereading Activities for Content Area Reading and Learning

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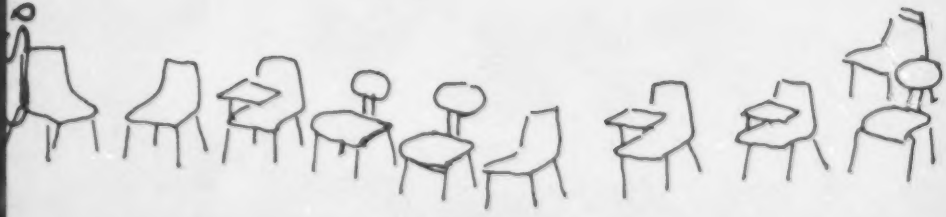

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Foreword

What a reader brings to a text determines in large measure what a reader takes from the text. When one can draw upon prior experience and previously obtained knowledge to fashion a rich context for the information and ideas being encountered in the text, one is more likely to read with understanding. Thus, what students know before they read an assignment will strongly influence what they learn by reading that assignment.

The influence of prior knowledge on readers' comprehension is not a new concept to most professionals who teach reading or conduct research within the general area of schema theory. However, while content area teachers may understand the concept, many may lack the instructional strategies by which to operationalize the concept. This book addresses that lack.

The authors have drawn from many sources to assemble a collection of instructional options for preparing students to read their texts in different content areas. The options are practical in that they can be integrated naturally into lessons normally taught in content area classes. The options are productive in that they enhance students' learning both while being prepared to read and while reading.

The authors raise two cautions the reader should heed. First, there is more to reading instruction in content areas than just preparing students to read their texts. It is important to guide students while they read to assure the comprehension of their texts and guide them while they engage in postreading activities to reinforce and extend the concepts acquired through the reading. The authors consistently caution readers of this book to fit their suggestions into this larger instructional context. Second, they point out that their suggestions are options to be used selectively, not entirely, within given lessons. More suggestions are provided than any one teacher could use in any one unit of instruction. The authors point out the need to select from the strategies those that fit the objectives of the lesson and the needs of the students.

This book, then, is a useful resource for content area teachers who wish to improve their students' reading performance. It should be productive for both teachers and students.

Harold L. Herber
Syracuse University

Preface

Prereading Activities for Content Area Reading and Learning includes a description of numerous ways to prepare students to learn from printed materials. It is a compendium of techniques, or methods, which classroom teachers can employ with individual students, small groups, or whole classes. Examples are provided along with the description of most activities in order to provide a clear view.

Chapter One introduces the reader to the content. It describes characteristics of learners which teachers can address directly to prepare students for what they read. Chapters Two through Five contain descriptions of specific prereading activities. Chapter Six presents considerations to be made while selecting or designing specific prereading techniques.

This monograph is intended to supplement a basic text or instructor's manual because it presents only a certain part of the process involved in helping students learn from their texts. In fact, we emphasize that even though our concern here is with prereading, readiness issues, review and enrichment activities that follow student reading are also essential. Students need to follow up what they read just as they need to be prepared for what they read. Information gained from the text can be applied to new situations, students can reflect on the information, and reading strategies can be refined during the postreading stage of a lesson. This monograph is not meant to deny the value of postreading activities.

Indeed, most of the techniques described in this monograph consist of both a pre and a postreading component. Whenever a specific reason for reading is established, follow up occurs to determine whether that reason was satisfied. If students are asked to read in order to find out how General Custer and his troops were defeated at the Little Big Horn, they will share what they learned about Custer's defeat. Although in this discussion we stress the prereading, readiness components of teaching activities, it is important to realize that postreading follow up is also called for.

Our goal is to describe the teaching activities as clearly as possible so that practioners can implement them independently.

DWM
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Chapter One

Readiness to Read in Content Areas

When students read materials in content areas such as biology, history, and vocational arts, they encounter distinctive viewpoints and explanations of the world. Biology describes the life processes of living organisms; history records and interprets past events; and vocational arts explore and provide training for careers in specific trades. In explaining these different aspects of the world, content materials may contain unfamiliar concepts, strange terms, and particular styles of writing. As a result, students frequently require guidance as they attempt to learn and act upon new information. Content area teachers have an important role in providing such guidance.

Activities that guide students as they read enable them to understand and acquire information that otherwise would be inaccessible. Providing guidance is the opposite of simply handing out a passage and telling students to read it and prepare themselves for some kind of future exam. Instead, it means providing activities before, during, and after reading assignments in order to help students understand and retain what they read (Herber, 1978).

Activities that occur before students read content materials are essential because they prepare students for the target passage (Cansler, 1954). The role of such activities has been recognized in the professional literature since at least the turn of this century. In the preparation stage of a reading lesson, "The object is to give the thoughts of the pupil a definite tendency, to arouse expectation, stimulate interest, and give intellectual activity from the beginning..." (Mulliner, 1898). Following this explanation, Mulliner provides a sample lesson with a distinct prereading stage for a portion of Spenser's *Faerie Queene*.

At one time, educators used the term "reading readiness" to refer exclusively to the step of introducing preschool and primary grade children to print. However, the limitations of this view of readiness became apparent in the 1940s (Gray, 1942). Since then, reading readiness has come to mean one's preparedness for any reading task. Students are ready to read and learn from a passage when they have acquired adequate prior knowledge, appropriate reading strategies, and control of that knowledge and those strategies to satisfy their reasons for reading.

The remainder of this chapter describes five characteristics of students that can be addressed directly in order to prepare them for immediate content area reading tasks. The descriptions of these aspects are meant to specify what readers need in order to be prepared for a passage; the following chapters describe how you can design activities that provide readers with what they need. The five characteristics are: 1) Motivation, 2) Content Knowledge, 3) Word Knowledge, 4) Learning Strategies, and 5) Attention.

Motivation

Motivation is defined as that which arouses and sustains a person's behavior. Providing the motivation to read content materials is a primary task of content area teachers. To use Willie Loman's words, "It comes with the territory." Ideally, all students are highly motivated, eager readers who have the urge to master whatever information is presented. Realistically, many students are apathetic, frustrated readers who view reading assignments as something to avoid. As a result, before guiding these students through content materials, you need to convince them to begin the journey. Students who won't read are as disadvantaged as students who can't read.

Studies of engaged time on task reemphasize the importance of motivation (Gage, 1978; Berliner, Fisher, Filby, & Marlieve, 1976). These studies relate students' achievements with time spent actively engaged with instructional activities. In essence, the findings from these studies corroborate the sensible notion that increased achievement results when students persist at their tasks. The challenge, of course, is to provide positive instructional settings which motivate students toward such persistence.

Motivating students in a positive manner relies largely on capitalizing on their curiosity (Gibson & Levin, 1975).

Young children, adolescents, and adults want to explore their environments. When presented with a new stimulus, they want to know what it is. This natural phenomenon drives them to seek information about people, places, things, and events. Deep down, people like to make sense out of what often appears to be an uncertain, chaotic world. Directing students' basic curiosity to the topics and explanations of the world around them is crucial for motivating students to read. Educators must provide materials at appropriate reading levels so students can read to satisfy their curiosity. In addition, teachers should maintain disciplined classroom organization that is conducive to silent reading. The following chapters of this monograph offer activities that can motivate students and help sustain their efforts toward reading specific content area materials.

Content Knowledge

Assuming that students are motivated to read certain materials, their ability to learn new information depends on how familiar they are with its content. To illustrate this point, consider the following paragraph.

> Openness versus Closedness
>
> A closed model is not amenable to representing any other kind of operations than those it already encompasses (e.g., "autonomous syntax" in linguistic theory). An open model can be expanded as new insights accrue, without requiring a fundamentally new design (e.g., models based on general cybernetics). The implication often is that open models are to be construed as merely representative of understanding operations, rather than as exhaustive statements. Here, the design of the models themselves is often more revealing than the claims of the researchers involved (DeBeaugrande, 1981, pp. 266-267).

Did you understand the above paragraph? Even though you probably were motivated enough to read it carefully, and most likely you were able to pronounce each word and read the sentences fluently, we suspect that you may have difficulty explaining the paragraph to someone else. This difficulty could be due to limited prior knowledge about the subject matter discussed. The two examples (*autonomous syntax* and *models based on general cybernetics*) were meant to illustrate the key points of the passage. But you need to understand those examples in order to grasp the concepts which they illustrate. In other words, you—and the students you teach—need to have

adequate prior knowledge of the content of a passage in order to understand it.

The difficulty of ideas depends largely on their concreteness and on readers' previous experiences with them. For example, the concept represented by *dog* is already known by most children of kindergarten age. Most youngsters have petted dogs, been scared by big dogs, cuddled puppy dogs, and heard dogs bark. Children have had numerous direct, concrete experiences with those animals, so they have a firm grasp of the concept of dog. However, youngsters can have difficulty with abstract and infrequently experienced concepts. For instance, the concept represented by *mil* is unfamiliar to most children. Youngsters do not have the opportunity nor the need to measure the diameter of wire, so they have not encountered a unit of length that is equal to .001 of an inch. Moreover, units of measure are difficult concepts for children to grasp initially because of their abstract nature. Even though *dog* and *mil* are easy words to pronounce, the concepts they represent are quite different. Considerable prereading attention would be necessary to develop student understanding of *mil* if that concept were important for understanding a passage.

Students need to be familiar with the content of a passage, and their knowledge needs to be activated. Students should recognize that they know something about a topic. To illustrate this point, read the following.

> The procedure is actually quite simple. First you arrange items into different groups. Of course one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step; otherwise, you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first, the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then, one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life (Bransford & Johnson, 1972, p. 722).

You probably thought that paragraph was incomprehensible. Individual sentences may have made sense, but the paragraph did not seem to hang together. If you were to retell everything you could remember about the paragraph, your score probably would be quite low. However, if you had known

before reading the passage that it was about *washing clothes*, you probably would have thought the paragraph quite comprehensible and your retelling score would have been much higher. Try reading it again, and see how much sense it makes now!

This example points out the need for activating learners' knowledge about a topic before they read about it. In their own ways, students know a lot about content area topics such as democracy, supply and demand, diffusion of elements, and ecology. They just don't always know that they know. As with the "washing clothes" example, you knew quite a bit about the passage, but you didn't realize it. Bringing forward readers' understanding of topics is an important component of prereading, readiness activities.

Word Knowledge

Identifying the printed words in content area passages is an obvious reading task. In order to deal with the concepts represented by a passage, students need to know the words. You can't deal with the concept represented by #¢&+ because you are unable to identify what that configuration of symbols represents. Similarly, high school shop students may have difficulty realizing that the word *chamois*, which they see in their textbooks, has any connection with the cloth they use almost daily to wipe their cars. Understanding the concept is one thing; identifying the printed word or words that represent that concept is another.

It is important to realize that even though word identification is necessary for reading content materials, it does not guarantee understanding. As we pointed out in the preceding section, there is more to reading than being able to identify each word on a page. However, content area materials do include unfamiliar words that present identification difficulties and need to be taught to students.

While planning content lessons, a distinction can be made between the conceptual difficulty of words and their identification difficulty. The latter concern involves helping students independently "figure out" which concepts are represented by words. To return to an earlier example, the conceptual difficulty of *dog* and *mil* varies drastically, but the spelling pattern is nearly identical. Both three-letter words are comprised of a vowel in the middle and single consonants on either end. However, *warfare* and *buoyancy* represent a

different situation. These terms represent concepts that are essentially equal in difficulty, but their ease of identification may vary considerably. That is, students could understand the concepts represented by *warfare* and *buoyancy* with about equal effort, but the irregular spelling pattern of *buoyancy* may cause some difficulty with initial identification. Because of this, you would need to spend time during the readiness stage of an assignment explaining the structure and contextual setting of that term. *Buoyancy* could be located in the reading passage and its meaning inferred from the way it is used. Other forms of the word such as *buoy* and *buoyant* could be presented. The three syllables in *buoyancy* might be underlined. Finally, the word could be lettered on a card and posted in your classroom for daily review.

Different features of words deserve attention as you introduce them to your students. The fundamental features, of course, are the concepts words represent. If the meaning of a word is not understood, then knowing its other characteristics is useless. At all times, devote attention to the meanings of words when their other characteristics are pointed out. Other features of words found in the text that deserve attention include contextual setting, spelling pattern, and morphemic composition.

Contextual Setting

Whenever possible, point out the contextual setting of important words, the way they are used in a passage. However, be certain that a contextual setting provides sufficient information about a term before directing students to attend to that information. Consider the following three sentences:

1. His *felodese* totally shocked some people and merely surprised others.
2. Some people resort to *felodese* to escape from their problems.
3. *Felodese*, or suicide, is the ultimate form of deliberate self-destruction.

As you can see, all three sentences contain the same uncommon term (*felodese*) and the same number of words. However, sentence three provides many more direct, explicit

cues to the meaning of that uncommon term than do sentences one or two. Clearly, it is important to determine whether sufficient meaning cues are available in a passage before directing students to "use context" to identify unknown words.

Spelling Patterns

Spelling patterns can be regular in that they contain predictable letter-sound correspondences, or they can be irregular by containing unpredictable letter-sound correspondences. The words below are examples of regular and irregular spelling patterns.

Regular Spelling Patterns	Irregular Spelling Patterns
esker	facade
endorse	naive
concave	alkali
larva	paranoia
acute	schism
pulsar	chameleon
thorax	phlegm
boycott	ricochet

Although you need to spend no more than a few minutes of any lesson with the spelling patterns of words, it is helpful to alert students to terms containing irregular patterns in an effort to reduce confusion about pronunciation. Pointing out the regular spelling patterns of other terms helps students understand pronunciation. While accurate word pronunciation is a limited goal, students must acquire the ability to identify the names of the concepts being studied. Once teachers and students share common labels for ideas, the business of developing those ideas can proceed efficiently.

Morphemic Composition

The morphemic composition of words consists of their meaningful parts. Derived words consisting of prefixes, roots, and suffixes, and compound words contain two or more meaningful parts. The morphemic composition of the following terms could be pointed out as a way to help students identify the words and infer their meanings.

Derived Words

polyphonic	invertebrate
triangular	semitropical
micrographics	intergalactic
bacteriology	personification
gateway	craftsperson

Learning Strategies

Students may have appropriate levels of motivation, adequate prior content knowledge, and sufficient word knowledge; but they still may have difficulty learning new information from a passage. This difficulty may be due to the fact that they do not have appropriate learning strategies for the text.

Strategies are plans that are employed to achieve certain goals. For instance, successful basketball coaches employ numerous strategies to win games. Sometimes they use a one-on-one defense and sometimes a zone defense. Player substitutions are made at strategic times, and the tempo of the game is varied by stalling or by running a fast break. Different strategies are applied according to the demands of the situation.

Learners also have available numerous strategies (Anderson, 1978; Brown, Campione, & Day, 1981; Laycock & Russell, 1941). Helping students apply the learning strategies which are most appropriate for certain portions of material to be read is an important part of the readiness stage of content reading assignments. In this section, we briefly describe three learning strategies. Of course, there are more than three strategies available to learners, but we have omitted possibilities such as visualizing and reviewing information and creating mnemonic devices in favor of three which can be directly addressed in the prereading stage.

Anticipating Information

Anticipating information involves predicting what information is coming in a passage. It calls for readers to think ahead while reading. Once readers have a set of expectations for a passage, they can settle in and see which expectations are met, which are not, and what new, unexpected information is encountered.

Think of the first formal party you attended. You knew that things were going to be different, but you weren't sure how different. You didn't know what to expect. That party was probably an uncomfortable experience until you were able to determine for yourself what to do and how to act. The situation is similar to reading and learning from text. Students are at a disadvantage when they don't know what to expect from a passage and they aren't in the habit of thinking ahead about upcoming information. They are unprepared for the stream of ideas that they encounter while reading.

Helping students anticipate information can be accomplished by telling them what to look for. If a passage is mainly about a topic such as the Oklahoma Land Run, the effects of yeast on bread dough, or the safety features of an arc welder, you can provide an overview and stimulate thinking through questions or statements about each passage, giving the class an advance idea of its contents. Furthermore, students may be stimulated to inspect the passage on their own so that they form independent expectations. Whatever the case, attention should be given to helping students anticipate information while they are being guided through content area materials.

Elaborating Information

Perhaps the best way to learn new information is to elaborate it when it is first encountered. Elaboration involves thinking deeply about a topic and developing and expanding it. This process occurs when new information is embellished by connecting it with what one already knows. In social studies, for example, students might read the following passage:

> The biggest differences that developed among the American Indians were a result of where they settled to live. There were five main living centers where these people settled: the Northwest Coast, the California region, the Southwest, the Eastern Woodlands, and the Plains.

While reading, your students might elaborate the above information by thinking of specific tribes that live in the five main centers. For example, they might think "I know about the Apache, Navajo, and Pueblo Indians in the Southwest. I know that their traditional way of life differs from the Sioux and Comanche Indians of the Plains." Additionally, remembering the general principle that environment influences the way of life of all living organisms helps explain why differences are found among American Indians. Through elaboration, stu-

dents connect what they already know with new information they are learning. Thus, they more easily recall that new information later because they have a variety of ways to get to it.

Organizing Information

The value of organizing information as an aid to learning has been recognized at least since Aristotle, and current research has convincingly demonstrated that our long-term memories consist of organized systems (McKoon, 1977). Because of this, arranging information according to meaningful classifications is an effective learning strategy. Outlines and graphic organizers are discussed in Chapter Five as teaching procedures designed to develop students' abilities to organize what they read.

Following the organization of ideas in expository passages facilitates recall of those ideas (Meyer, Brandt, & Bluth, 1980). Readers who are sensitive to the organizational pattern of a passage typically learn more from that passage than students who are insensitive to the pattern. Because of this, helping students determine which passages follow a time order sequence and which ones relate causes and effects, problems and solutions, simple listings, and so on seems to be an appropriate prereading activity.

Helping students apply strategies appropriate for learning certain portions of material is an important part of the prereading, readiness stage of a lesson. To assure that students become proficient with a learning strategy, you should give them occasional, direct instruction. Chapters that follow describe procedures for helping students anticipate, elaborate, and organize the information they encounter during content area reading. This instruction can be provided as you work through the actual content materials in your class. Then, as your students encounter new passages, they will have opportunities to apply the learning strategies developed earlier.

Attention

We each have only a limited capacity for taking in information and making sense of it. This limitation becomes readily apparent to you when two persons talk to you at the same time. When such a situation occurs, you must internally

turn off one message and attend only to the other. Otherwise, you become confused and miss both messages. In short, attention needs to be focused on specific information in order for it to be learned (Travers, 1977).

In order to learn from content materials, students must acquire varying levels of motivation, content knowledge, word knowledge, and learning strategies. In addition, students must have the ability to attend to material at both general and specific levels. The general level involves asking boisterous, distracted students to "Pay attention!" Getting students to pay general attention depends on factors such as motivation (discussed earlier).

The specific level of attention involves selecting information in a text for study at the expense of other contiguous information. Because of limited capacities, readers need to select important bits of information in text and disregard less important information. Otherwise, all words, phrases, sentences, and paragraphs appear to have equal importance, and the barrage of information becomes overwhelming. Readers must face the problem of determining what merits attention.

Readers' purposes, or reasons for reading, determine which information deserves attention. Different purposes help focus attention on different aspects of a passage. For example, consider the "American Indians" passage presented earlier. Some students might read that passage to learn the major differences among American Indians, others might want to know the number of main living centers, and still others might want to learn the location of the five centers. In fact, all three, or none, of these purposes might constitute a reason for reading. The point is that purposes for reading influence which aspects of a passage deserve attention.

There is little doubt that skilled readers vary their attention to ideas in print according to their reasons for reading (Frase, 1977). However, helping readers focus their attention on pertinent information is a major task during content area instruction. Helping students learn how to independently clarify specific reasons for reading is important, also. These two concerns can be addressed during the prereading, readiness stage of content reading lessons.

Summary

We have described five characteristics of students to consider while planning content area reading assignments.

We stress that these five characteristics can be combined and addressed during one prereading, readiness activity. For instance, an activity that develops students' content knowledge prior to reading can, at the same time, influence students' motivation to read. Specific learning strategies for certain portions of a passage can be elicited so that attention is directed to certain information within that passage. Increasing students' knowledge of word features can and should go hand-in-hand with developing students' knowledge of the content represented by each word.

Consideration of each of the five aspects presented here will help you pinpoint activities that prepare specific groups of students for what they read. The following chapters will describe many readiness techniques that focus on these aspects in various combinations.

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Chapter Two

Asking and Answering Questions before Reading

> In the development of intelligence, nothing can be more "basic" than learning how to ask productive questions (Postman, 1979, p. 153).

Questions play an integral part in learning about the world. Indeed, it is difficult to imagine an attempt to function effectively in the world without asking questions and receiving answers. Questions also play a dominant role in reading and learning from text. And they are a major device, if not *the* major one, in the instructional repertoire of teachers.

Though questions serve many functions, they might be classified generally as evaluative, motivational, or both (Cunningham, 1981). Evaluative questions diagnose what students do or do not know, and they assess students' completion of assigned readings. Motivational questions are designed to cue readers toward particular learnings or guide their thinking beyond the text. Stated another way, evaluative questions are designed to determine what students have learned, while motivational questions are designed to help students learn in the first place. This latter function of questioning is discussed here.

The questioning procedures included here affect several student characteristics described in the first chapter of this monograph. These questioning procedures are designed to stimulate student curiosity about a passage to be read, activate prior content knowledge, lead students to anticipate and elaborate what they read, and focus attention on specific information. Additionally, the procedures to be discussed demonstrate a progression from teacher-originated questions to teacher-student reciprocal questions to student-originated questions. This progression is intended to lead students from dependent to independent learning from text.

Levels of Questioning

Before proceeding to a discussion of specific procedures, one other aspect of questioning should be mentioned—the level of understanding expected of the students. The levels of comprehension construct proposed by Herber (1978) and Pearson and Johnson (1978) articulates this aspect of questioning. The levels of comprehension construct might be conceived of as a tool to help teachers lead their students beyond merely parroting an author's words. It provides a framework for developing questions that help students use their own thoughts and prior experiences to interact with the information provided by an author.

Levels of comprehension include literal (or textually explicit) understanding, interpretive (or textually implicit) understanding, and applied (or experientially-based) understanding. Specifically, literal questions involve getting the facts as stated by the author. A literal question is based directly on the text, and an answer to such a question is explicitly cued by the language of the text. Readers can point to the answer on the page, and usually there is only one correct answer. Interpretive questions, on the other hand, require readers to determine an appropriate answer drawn from the text and from their prior knowledge. Interpretive questions are drawn directly from the language of the text but require readers to derive an answer not directly visible in the text. Readers are asked to infer what the author has implicitly stated and elaborate the given information. Readers take the facts presented by the author and add knowledge from their backgrounds to derive a plausible answer implied by the author. Thus, answers may vary based on the type of experiences students bring to the printed page. Finally, applied questions also require readers to think beyond what is stated in the text. When applied questions are asked, readers are asked to draw information primarily from their previous knowledge to derive plausible answers. Answers to these questions are based mainly on reader experience as they are not directly obtained from the text; thus, numerous answers are possible.

A paragraph with accompanying questions to illustrate the levels of comprehension construct follows.

The Quest

As Tom peered through the thick undergrowth, he could barely make out the figure that stared back at him. Careful not to let the heat of sun

confuse his judgment, he trudged closer toward the figure to more carefully identify it.

Q. 1. What was Tom peering through?
Q. 2. Where was Tom?
Q. 3. What was the figure that stared back at Tom?

In Question One, the answer comes directly from the text—"thick undergrowth." It can be literally pointed to. In Question Two, the answer, though drawn from the language of the text, is not directly visible. Thus, the facts of "thick undergrowth," "heat of the sun," and "trudging" might be put together with previous knowledge to answer, "jungle," "woods," or "savanna." All of these answers are plausible interpretations given the language of the text and the differential backgrounds of students. Finally, in Question Three, many answers would be allowable as answers are not derived from the text but from the experiences of each student. Such an applied question requires thinking about a topic triggered by the text but primarily based on reader experience.

Asking students questions before they read tends to focus their attention on various types of information. For example, if students read to find answers that are stated literally in a passage, they tend to learn only that information. This technique can be helpful when the text is especially dense, and the goal is to help students acquire literal-level information. On the other hand, having students read in order to answer higher-order questions that call for interpretive or applied understanding tends to promote more general, overall learning from a passage. In other words, literal level questions generally narrow a reader's focus on information. If you are directed to "Read in order to identify the capital city of Yugoslavia," then you may come up with *Belgrade* but little else.

Teacher Questioning

Establishing specific reasons for reading a passage is crucial. Otherwise, students tend to treat all information as equally important, and they attempt to master it all. The overall concern teachers have while designing or choosing questions for students is, "What do I want my students to know after they read the selection?" Once this is determined, purpose-setting questions can be set to focus student attention on those aspects of the text.

To provide an example of the types of questions teachers might ask students before they read, the following sample text will be used. It should be mentioned that this sample text is not typical of the length of passage students will encounter in content classrooms. Rather, the sample is being used for illustrative purposes to facilitate the discussion of teacher questioning.

Phases of the Moon

Half of the moon is always brilliantly lighted by the sun. From earth the illuminated side is seen only when the moon is opposite the sun; however, when the moon is in the direction of the sun, no lighted section can be observed. Otherwise, only portions of the bright side are visible. These varying appearances are called phases and are divided into four quarters.

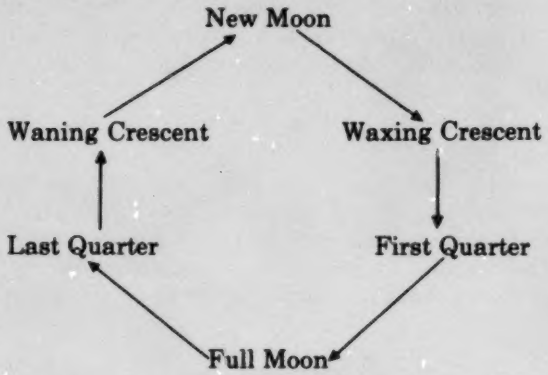
The new moon appears only when the moon is on the side of the earth most directly in line with the sun. There is no illumination on the earth's side, so it is sometimes called the dark moon. Shortly after the dark moon, a thin waxing crescent moon appears. The first quarter occurs when half the side of the moon facing the earth appears illuminated. It reaches its zenith for the day at sundown. The full moon appears when the entire surface of the moon is illuminated. It stays up all night long, reaching its zenith about midnight. The full moon nearest the autumnal equinox, when days and nights are of equal length, rises very quickly. It lights the way for late-working harvesters and is called the harvest moon. Like the first quarter, the last quarter is seen illuminated on half the side facing the earth. The following crescent is known as the waning crescent moon or old moon. Gradually, it approaches the phase of the new moon completing the cycle (adapted from *Compton's Encyclopedia*, 1971, *15*, 483-484).

Since with teacher-originated questions the teacher decides what specific information deserves attention, let's assume that students will be expected to learn the following (listed in order of importance):

1. The moon takes on various appearances as seen from the earth depending on its position in relation to the sun.
2. These varying appearances, or phases, are divided into four quarters.
3. When no part of the lighted moon is seen, the moon is directly in line with the sun.
4. When the entire lighted surface of the moon is seen from the earth, the moon is positioned opposite the sun.
5. In between the new moon and full moon, various other phases of the moon are visible.

In asking questions at various levels of comprehension, teachers will activate prior knowledge concerning the revolu-

tion of the moon about the earth. As such, this will facilitate the focusing of student attention on the major concept that the relative position of the earth and the moon with respect to the sun determines the moon's phases. The following diagram may also be helpful in promoting discussion and activating prior knowledge.



The following questions, categorized by level, are representative of the kinds of questions teachers might ask students in introducing material concerning "Phases of the Moon":

Literal Questions

When does the new moon occur?
What are the various phases of the moon?

Interpretive Questions

Why do we see varying appearances of the moon?
What is the difference between a new moon and a full moon?

Applied Questions

Approximately how long does it take for the moon to complete its cycle?
If the sun always illuminates half the moon, why can't we always see it?
What benefits to people other than harvesters might arise when a full moon is visible from earth?

These are not the only questions teachers might ask in introducing this material, but they are representative of those

kinds of questions which can be asked to prepare students for the concepts and vocabulary they will encounter when they read. Questions such as these may be modified depending on students' prior knowledge concerning this topic. Additionally, it is emphasized that these questions are being asked to stimulate curiosity, activate content knowledge, increase student anticipation and elaboration of information, and focus attention on major concepts to be encountered in reading. The questions are being asked to introduce students to the material to be encountered in a passage.

Concerns about Teacher Questioning

A number of concerns about teacher-originated questions must be addressed. First, to formulate good questions representative of all levels of comprehension requires time and thought. Second, care must be taken that questions asked to provide purpose also provide specific cues for student comprehension. General, diffuse questions will not facilitate comprehension; rather, only direct, precise cues provided by questions seem to be significant in improving comprehension and recall performance (Hansen, 1977). Third, and of major concern, is that while students may have learned to depend on teachers and texts to ask questions they may not have learned to ask appropriate questions of themselves (Manzo, 1975). Fillion (1981) reports that students are conditioned to respond rather than initiate. He makes the case that teacher questions 1) are not necessarily the questions students would ask or want to have answered, 2) crowd out student opportunities to ask questions, and 3) do not permit us to find out whether students are learning to ask questions on their own. In other words, answering questions only indirectly teaches students the skills necessary to process information selectively in independent reading (Readence & Moore, 1979).

Teacher-Student Reciprocal Questioning

While teacher questions are of value in reading and learning from text, promoting active comprehension (Singer, 1978) will go a long way in leading students toward independence in their reading. The object of active comprehension is to have students learn to ask their own questions and to guide their own thinking in learning from text before, during, and after reading. Andre and Anderson (1978-1979) provide evidence that student-generated questions can lead to improved

comprehension. They attribute this finding to the fact that generating questions entails deep processing of the text.

Singer (1978) proposes that the key to active comprehension is to guide instruction so that skill in asking questions will transfer from teachers to students. As such, he proposes a three-stage model designed to teach for transfer of question-asking: 1) modeling behavior, 2) phase-out/phase-in strategies, and 3) active comprehension. Modeling behavior consists of teachers demonstrating to students what constitutes good questioning behaviors. This entails taking students through lessons, showing them the kinds of questions to ask, and modeling the processes of thinking involved in designing questions. Phase-out/phase-in strategies occur when students are then encouraged to formulate their own questions. This may be accomplished by having students progress through a lesson with teacher guidance and providing students a safe atmosphere in which to ask their own questions in their efforts to comprehend the text. Gradually, the teacher takes less and less of a role in question formulation. As students begin to ask their own questions without teacher prompting, they are engaging in active comprehension.

Using Singer's three-stage model, we can see the teacher-originated questions described earlier as the means by which teachers begin to model question-asking behavior for students. Next, students are provided an environment which stimulates phase-out/phase-in strategies. Finally, strategies which focus on active comprehension follow. Our discussion of asking questions before reading follows this plan.

ReQuest

ReQuest, an acronym for *re*ciprocal *quest*ioning, is a strategy developed by Manzo (1969) which is designed to help students 1) formulate their own questions about the text material they are reading, 2) develop an active inquiring attitude toward reading, 3) acquire purposes for their reading, and 4) begin developing independent comprehension abilities. ReQuest involves the students and teacher in silently reading portions of text material and then taking turns asking and answering questions concerning that material. It is the reciprocal nature of the questioning sequence that differentiates ReQuest from teacher-directed questioning strategies and provides the format for active involvement on the part of the students.

Central to the success of this strategy is the role of the teacher. The teacher answers students' questions and serves as a model of good questioning behavior by asking thought-provoking questions that extend students' developing concepts. As such, we can conceive of ReQuest as a phase-out/phase-in strategy in the Singer model. Teachers continue to model good questioning behaviors, and students gradually take over more and more responsibility in the questioning sequence as they become accustomed to the strategy. Thus, ReQuest helps bridge the gap between modeling question-asking behavior for students and active comprehension utilizing their own questions.

The ReQuest technique consists of

1. Preparing the selection
2. Readying the students
3. Developing questioning behaviors
4. Developing predictive behaviors
5. Silent reading
6. Discussion of the reading

In preparing the selection for ReQuest the teacher must assure that the difficulty level of the material is suitable for the students. Additionally, the teacher must decide how much material will be read at one time (one sentence, two sentences, or a paragraph). The ability and maturity levels of the students dictate the amount of material to be read. Finally, the teacher identifies appropriate points in the text where predictions will be elicited.

Readying the students consists of communicating to them the guidelines, or rules, for ReQuest. It also may be necessary to acquaint students with new vocabulary to be encountered in the selection and to create interest or develop background for the reading.

Following joint silent reading, students begin questioning behaviors by asking questions of their teacher. The teacher answers the questions and, in turn, refines and extends the developing concepts by asking questions of students. To reemphasize, the reciprocal nature of questioning in this technique is what differentiates ReQuest from traditional questioning strategies.

When a sufficient amount of material has been read, predictions about the outcome of the selection are elicited from the students. Students must also provide justifications for their predictions. Once this is completed, students silently read the

rest of the selection for the purpose of verifying their predictions. After the reading, discussion of the reading ensues with the prime focus being the reconsideration of the students' predictions with regard to the outcome of the selection.

By formulating their own questions about a selection and trying to construct questions to extend the teacher's thinking, students become actively involved before the actual reading of the material. Eliciting student predictions serves as the culminating part of this prereading strategy as it leads students to tie together what they read in order to formulate those predictions. Students then read with greater readiness as they attempt to verify their predictions.

When ReQuest is first used, students typically ask many literal-level questions. It is here that the teacher asks questions on higher levels of comprehension to act as a model and to help students integrate the material they are reading with their prior knowledge about the topic. Thus, the teacher can be assured that students will be introduced to the major concepts to be learned from the text. Simultaneously, the teacher is beginning the phase-out/phase-in strategy toward active comprehension. Through the reciprocal nature of ReQuest, students will gradually learn to ask more thought-provoking questions as question-asking responsibility gradually shifts to them through repeated experiences with the strategy. This transfer may be even further promoted by having students work in pairs or small groups, without direct teacher guidance, and asking questions of one another using the procedural steps of ReQuest.

Student Questioning

To this point we have discussed the use of teacher-originated questions wherein teachers take the dominant role in readying students to read. Next we discussed the phase-out/phase-in strategy of ReQuest whereby students gradually take a more active role in questioning and purpose setting. In this section we will discuss the Directed Reading-Thinking Activity (DRTA), developed by Stauffer (1969), in which students take the dominant role in readying themselves to read and teachers become moderators. Shepherd (1978), among others, also has discussed the use of DRTA in content reading.

The purpose of the DRTA is to promote active comprehension on the part of students by developing their abilities to

assimilate information as they read and to continually refine their purposes—based on the notion that students will utilize their own experiences in attempts to reconstruct an author's ideas. The DRTA begins with the generation of hypotheses for reading and continues with the refinement of these hypotheses as new information is extracted from text. In essence, the reader poses questions, tests these questions on reading the text, and generates new questions as reading progresses.

The DRTA consists of 1) directing the reading-thinking process and 2) fundamental skill training. The first part of the DRTA entails setting purposes for reading, reading to verify these purposes, pausing to evaluate understanding, and then proceeding to read with the identical or new purposes. The second part of the strategy consists of having students reexamine the selection for the purpose of systematically training students to effectively utilize reading skills such as word attack, contextual analysis, and concept development. The focus of this discussion will be on the initial phase of the DRTA—directing students' reading-thinking behaviors to promote active comprehension.

Essentially, directing the reading-thinking behaviors of students involves three steps: predicting, reading, and proving. The teacher should divide the material to be read into appropriate segments. Students will proceed through a segment of text to define purposes for reading and evaluate and revise these purposes using the information they acquire. The teacher acts as a facilitator of this process.

Using our "Phases of the Moon" example, students would be directed to read the title and examine accompanying pictures or diagrams. In this case it might entail an examination of a diagram of the moon's phases. Students are directed to make predictions as to the content of the selection. They are encouraged to offer several different suggestions and to critically evaluate these suggestions. Students are then directed to read a segment of text to check their predictions. It should be noted that vocabulary is not introduced prior to reading; therefore, students should be encouraged to utilize the context to figure out unknown words they encounter. After they have read the initial segment, students are directed to close their texts and an examination of the evidence ensues. Previous predictions about the content are evaluated in the light of new information. Students are asked to provide proof of their predictions, and text segments may be orally read for

verification. If evidence arises to cause students to refine their predictions, new predictions are generated. Students would then be directed to read a new segment of text and the predicting, reading, and proving cycle would continue. As reading progresses, predictions, which at first may be divergent, will converge as more and more information is amassed. It is recommended that once predictions about the material converge, students be directed to read the rest of the selection on their own.

Thomas (1978) has suggested a modification of the DRTA to be used when students encounter content material containing an abundance of factual material, much of which is to be retained by the reader. The format of the Directed Inquiry Activity (DIA) retains many of the features of the DRTA, but it differs by utilizing a framework of six key questions: Who? What? When? Where? Why? How? As with the DRTA, the DIA begins with an initial survey of the title, subheadings, and accompanying pictures or diagrams. Students are then encouraged to predict responses to the six key questions. The predictions are recorded and then expanded wherever possible. When predictions are terminated, students are directed to read the rest of the material to verify their predictions. Following this, a critical analysis of the predictions is undertaken, using the information gained from the reading. Modifications are made under appropriate points of inquiry, if necessary.

As can be seen, both the DRTA and the DIA attempt to promote active comprehension on the part of students. Students are now asked to initiate rather than only respond to questions. Our final activity in this section, the Survey Technique, perhaps epitomizes the notion of active comprehension. Students, on their own, preview text material to formulate independent purposes for reading as teacher direction is further withdrawn.

The Survey Technique (Aukerman, 1972) is a whole-class adaptation of the initial step of the SQ3R study method. In essence, students systematically analyze the various graphic aids present in a text reading assignment to formulate purposes for reading. This prereading strategy consists of the following six steps:

1. Analyzing the chapter title
2. Analyzing the subtitles
3. Analyzing the visual aids
4. Reading the introductory paragraph

5. Reading the concluding paragraph
6. Deriving the main idea

More specifically, before students begin to read the text assignment, they should analyze the chapter title to discuss what might be included. Next, students skim through the chapter to locate and read any subtitles. It is suggested that the class devise a question to be answered by reading that subsection. In analyzing the visual aids of the chapter, students interpret graphs, maps, and/or charts for the gist of the information they summarize. Pictures are discussed to determine what they represent.

Next, students are asked to silently read the introductory and concluding paragraphs of the chapter. Usually these paragraphs provide readers with some general ideas about the chapter. A brief discussion following their reading is recommended. Additionally, the students might examine the postreading questions provided at the chapter's end. Students should have a relatively good idea of the chapter's contents by this time, so the Survey Technique is ended by having the students list ideas to be discussed in the chapter. From this a main statement is developed about the overall theme of the chapter.

At this point students are prepared to enter the text more thoroughly. Aukerman stated that this prereading strategy would take one-half hour of instructional time in the classroom. The authors recommend that a time limit be imposed once students are familiar with the procedure. This necessitates skimming for information central to the Survey Technique. Students can then independently survey the text chapter to ascertain information. A whole group discussion would follow to pool the various ideas derived by students, culminating with the generation of a main idea.

Setting time limitations in conducting the Survey Technique is designed to allow the students to begin to take more responsibility for deriving their own purposes for reading. As teachers observe students using this prereading strategy more effectively, they should gradually withdraw their guidance and direction. The end result of this should be that students will be able to conduct the text survey independent of the teacher, thus achieving the goal of active comprehension.

Summary

This chapter provides a rationale for the use of questions in a prereading situation to stimulate curiosity, aid students in activating prior knowledge and anticipating information, and focus attention on important concepts. Activities have been recommended which will allow teachers to provide guidance in the use of questioning and then to gradually withdraw their guidance until responsibility for using questions to set purposes for reading rests with the students. As such, these strategies follow the recommended procedures of Singer (1978) of modeling behaviors and phase-out/phase-in strategies until active comprehension results and students use self-questioning independent of the teacher.

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Chapter Three

Forecasting a Passage

The forecasting activities described in this chapter and the questioning procedures contained in Chapter Two are quite similar. They both emphasize prediction as a means of motivating students, activating content knowledge, increasing anticipation and elaboration, and highlighting important concepts. Forecasting a passage and questioning before reading are designed to stimulate students to adopt an inquiring, investigative frame of mind. However, the activities described here rely on statements and directions rather than questions.

Three prereading methods which teachers can use to enhance conceptual awareness will be presented. First, a general technique to lead students through discovery learning will be discussed; then two specific techniques, the Anticipation Guide and the Guided Writing Procedure, will be considered. All count on stimulating students to critically evaluate new information by relating that information to set beliefs and preexisting knowledge. Thus, students read with the purpose of making changes or modifications in current knowledge as new information is discovered.

A General Strategy for Discovery Learning

The issue of capitalizing upon controversy and curiosity arousal has been discussed in the literature by Bruner (1961) and by Lundstrum (1981). Both have discussed strategies to increase student motivation to read and, thus, increase comprehension. Using problem-solving situations, students' prior knowledge about topics is challenged in an attempt to have them deal with situations posed by teachers about what they will encounter when reading the text. Potential student solutions are discussed through the use of small group

interaction. With student curiosity at a peak, the text is read to present a possible solution or outcome to a given problem.

Consider the short story by Richard Connell (1924) entitled, "The Most Dangerous Game." In this classic work, a famous big game hunter becomes the hunted on a strange island after he falls overboard from a boat. Utilizing a strategy of discovery learning before students read, the story might be introduced this way:

> You are a big game hunter. Unfortunately, you have no weapons, and you have become the victim of a death hunt by another person on a small jungle island. Describe how you feel now that you are the one being stalked. Explain how you would save yourself.

Such a task most likely will raise a lively discussion as students react and defend their comments. At the termination of the discussion, students would read the story for the purpose of gaining new insight into hunting and enjoying a good adventure story.

Such an activity can be effective in all content areas. Another example might occur with physical education students who are unfamiliar with croquet. Have students inspect the equipment for croquet and then predict how a game may be set up with that gear. After a discussion of possibilities, students can find out how the game is actually played by reading a set of rules and then playing the game. In social studies, students can forecast the location of cities in a certain geographic area. For example, display a map that shows only the elevations, rivers, and mineral deposits of an area. Students can work individually, in small groups, or as a large group to forecast the location of the actual main cities of the area. Then display a map that contains the cities, states, and other demographic and political demarcations (Bruner, 1961).

Using such a strategy requires students to make predictions from their experiences, which may be done with only minimal information. With motivation aroused, students read to clarify their thoughts based on what the author has to say. Thus, students become actively involved in the comprehension process as the reading becomes more personalized.

Anticipation Guide

The Anticipation Guide is a more detailed activity that utilizes prediction. The Anticipation Guide (Herber, 1978) is a

variation of the study guide and is designed to enhance comprehension by encouraging students to make predictions about concepts to be covered in the text. It can be used in any subject area when students have some experiential background and preconceived notions relating to the concepts to be presented. Statements are created which support and contrast author ideas with student belief systems. Shablak and Castallo (1977) emphasized the key role played by conceptual conflict in stimulating curiosity by challenging prior knowledge and experiences of students. The purpose of an Anticipation Guide is to prepare students to read with specific purposes by creating a mismatch between their background of experiences and text information.

The following selection adapted from a seventh grade health book will be used as a sample passage:

> Sleep and Dreaming
>
> Physical rest alone will not substitute for sleep. If you rest in bed perfectly relaxed but awake all night, you will still feel very sleepy in the morning. A person must sleep for more reasons than just physical rest, but scientists do not yet know all the reasons.
>
> Generally, young people need nine to ten hours of sleep. Since individuals differ, *you* may need a little less or a little more than that. How much sleep you need depends on many unknown factors.
>
> Some people think they seldom dream and other people are quite sure they do not dream at all. Studies of human sleep have shown, though, that everyone dreams almost every night. If a person thinks he does not dream, it is because he does not remember dreaming when he wakes up. Despite the activity of dreaming, energy is conserved during sleep, and a feeling of peace and tranquility is encouraged (Richmond, et al., 1972, pp. 156-161).

The following steps are used in the construction of an Anticipation Guide (Readence, Bean, & Baldwin, 1981). Each step will be illustrated, wherever appropriate, with an example pertaining to "Sleep and Dreaming."

Step One The major concepts to be presented in the text, lecture, or media presentation are identified by first reading the passage and deciding what deserves attention.

Example:

1. Physical rest will not substitute for sleep.
2. Young people need 9-10 hours of sleep.
3. Everyone dreams a number of times nightly.

Step Two Determine which concepts will challenge or support students' beliefs. (All of our sample concepts could fit this criterion.)

Step Three Create three to five statements which challenge or support any preconceived notions students probably have about the key concepts. Allusions can be made to general common knowledge or clichés. The statements should stimulate students by presenting concepts about which most people have opinions but few facts. Indeed, White (1959) suggested that such discord is most effective when students' knowledge of the topic is neither too sparse nor too familiar.

Step Four Arrange the statements (with appropriate directions) on an overhead transparency, chalkboard, or ditto sheet. Leave spaces to the left of each statement for students to respond. An example guide is provided.

Anticipation Guide

Directions: Before reading the following passage about sleep and dreaming, take a moment to read each of the following statements. Put a check next to each statement with which you agree. Be prepared to support your decision.

_____ 1. Relaxing in bed is just as restful as actually sleeping.
_____ 2. If you dream a lot during the night, you'll probably wake up feeling tired.
_____ 3. Everyone dreams during sleep.
_____ 4. Most teenagers need at least 9-10 hours of sleep each night.

Step Five As each statement is discussed, students respond and defend their opinions. Simple "yes" or "no" answers should be discouraged. Alternate approaches might have students respond individually, then in groups which must come to a consensus opinion before a whole class "forum."

By responding to an Anticipation Guide, students will become motivated to read to accept, reject, or modify their prior set of knowledge based on new input from the text. The short discussion that follows each statement usually arouses the curiosity of students by forcing them to defend an opinion. Thus, students are actively involved with the course material before any actual reading takes place. The center of instruction is shifted away from the teacher to the learner.

The Anticipation Guide can also be diagnostic in scope, assessing the prior knowledge of individual students. Through the course of a class discussion, individuals may be identified who would profit better from alternative prereading or enrichment activities which expand upon the subject to insure an awareness of major concepts. Possible groupings of individuals may become apparent before any valuable instructional time is used. Some students who already display a firm grasp of the textual knowledge may be shifted to alternative areas of study.

Finally, after reading, the same statements can become a "reaction" guide where changes and modifications of responses are discussed and bolstered by factual material from the text. Students may want to point out specific parts of the passage that either support or refute their previous beliefs. It is cautioned, however, that agreement with the author's opinions is not mandatory.

Guided Writing Procedure

Of the basic academic areas, writing has received very little instructional attention (Graves, 1978). However, this situation appears to be changing. More and more educators are rediscovering the value of a balanced writing program in the school curriculum. The value of including attention to written composition in content area classes is being emphasized again, also. Attention to composition helps students crystallize their thoughts about a topic, and often generates new thoughts and insights. And writing in the content areas allows students to record their thoughts for future reference and review. A procedure for forecasting a passage while devoting attention to written composition is presented here.

The Guided Writing Procedure (GWP) (Smith & Bean, 1980; Searfoss, Smith, & Bean, in press) optimizes the interaction of the four communication processes—reading, writing, speaking, and listening—with written fluency in the content areas a major objective of this strategy. Prior topical knowledge is tapped and specific purposes and guidelines are set for the writing task. Sample writing styles are evaluated and appropriate editing completed. Students gain positive feedback and reinforcement of skills from the evaluation form. As with the Anticipation Guide, the GWP activates prior conceptual knowledge to enhance conceptual development. All

four processes interact to aid in the synthesis and retention of new learning material.

The GWP involves a number of steps which can usually fit within the framework of a three day lesson plan. This section will be primarily concerned with the first and second day activities which focus on an evaluation of prior concept knowledge and written expression.

Step One The topic of study is written on a chalkboard and students are asked to generate words or phrases which they associate with that subject. For purpose of illustration, we will use the example "Volcanoes."

Step Two A verbatim list of student responses is recorded on the board by the teacher or a student volunteer. Each student that responds may give a short explanation of the term chosen and why it is related to the topic being studied. A possible list follows:

Volcanoes

lava	Mt. St. Helens
destruction	eruption
ashes	crater
hot	dangerous
steam	fiery

Step Three The class builds a rough outline which integrates the terms into an organized framework. Example:

Volcanoes

I. Physical Qualities
   A. Crater
   B. Eruption
      1. Lava
      2. Ashes
      3. Steam
II. Description
   A. Fiery
      1. Hot
   B. Dangerous
      1. Destruction
III. Example
   A. Mt. St. Helens

Step Four Each student writes a short paragraph (three to five sentences) as a "first draft," using the outline to

guide the content and organization. This step should help attenuate the typical comment, "I can't think of anything to write." Using this format, some direction and organization is offered to even the poorest student.

Step Five The teacher collects and quickly analyzes the paragraphs using the GWP checklist. No marks are made on the student papers. The criteria on the checklist should be chosen by the teacher *before* the lesson, and only those standards should be judged by the teacher. For example, the objectives set in the planning stage may be organization of ideas, style, and mechanics. The following example illustrates how the checklist was used for paragraphs written by Jay and Marilyn to give them feedback on their writing.

Jay's Draft

Volcanoes are hot and firy and have eruptions of lava and steam and ashs and are danerus like Mt. St. Helens is.

Marilyn's Draft

When a volcano erupts, you know it! Steam and ashes shoot up into the air for miles and miles. Lava that flows down the creater.

Mt. St. Helens is in Washington and this hot, fiery volcano caused many people to leave the area because it is dangerous. It sure was a mess!

GWP Checklist

(√ = okay; 0 = needs revision; ? = can't tell)

Criteria	Jay	Marilyn
Organization of ideas		
Clear topic	0	√
Supporting details/examples	√	√
Logical flow	0	√
Comments:		
Style		
Shows variety in...		
Word choice	?	√
Sentence length	0	√
Comments:		
Mechanics		
Complete sentences	0	0
Capitalization	√	√
Punctuation	√	√
Spelling	0	√
Comments:		

Jay used correct punctuation and capitalization, however he needs to structure and organize his ideas more clearly as well as work on his spelling. Marilyn, on the other hand, needs to work on her sentence structure.

Step Six The student drafts and individual checklists are returned to the students the next day. The drafts are edited and polished using the checklist criteria. The teacher can provide individual help to students at this time by circulating through the room or arranging conferences at the teacher's desk. If many of the students have trouble editing their work, several sample drafts and checklists can be displayed on an overhead to discuss with students how a variety of edits might be undertaken according to checklist standards.

Step Seven The second draft is collected and compared to the first. Appropriate comments can be recorded at the bottom of the checklist for later use by students.

Step Eight After the second drafts are collected, the text is assigned for silent reading with the purpose set to look for information to revise their writing.

For third day activities, the text assignment is reviewed and discussed by the class. The students then work to expand and revise their second drafts based on the teacher's comments and new information gained from the reading assignment and follow-up discussion. Students may work in pairs or small groups with the teacher circulating to give additional assistance. These revisions can be graded or further expanded depending on class objectives. A quiz or other appropriate reinforcement activities also can be employed to review key concepts.

Since the GWP is a fairly intense activity, it should not be used for every classroom lesson. Some prior knowledge of the text material to be read is essential. Therefore, it is recommended that this procedure be used with topics that will be of general interest to most students.

Summary

Three prereading activities which promote conceptual awareness of text material by forecasting passages have been presented. Emphasis is placed on reading for the specific purpose of acquiring information to supplement, reinforce, or redirect students' preconceived notions about certain topics. The general strategy for discovery learning challenges

students to make predictions about what will be presented in text material when possessing only minimal information about it. The Anticipation Guide utilizes teacher-constructed statements to also challenge previously held beliefs about topics to be encountered in reading. Finally, the Guided Writing Procedure enhances prediction before reading but incorporates the added benefit of using reading, writing, listening, and speaking as the framework for promoting active comprehension.

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Chapter Four

Preteaching Vocabulary

Countless times it has been stated that vocabulary knowledge plays a central role in reading comprehension. Not only does common sense tell us this, but research by Davis (1968) has pointed out that students' comprehension of words reliably predicts their comprehension of passages. Though there are many distinct views on why vocabulary knowledge is a major factor in passage comprehension, it is safe to say that the number of word meanings a reader knows enables one to predict an individual's ability to comprehend text (Anderson & Freebody, 1979). Additionally, a search of the literature will provide various recommendations for increasing students' vocabulary. Whether through vocabulary notebooks, increasing the amount of free reading, or simply discussing new terms as they are encountered in required passages, subject matter teachers need to acquaint students with new vocabulary. In many cases this will entail actually developing content knowledge prior to reading, along with activating preexisting knowledge.

The point has been succinctly stated by Readence, Bean, and Baldwin (1981) that the role of content teachers should be to help students become "insiders" in their interaction with textbooks and subject matter. To illustrate this point, read the following paragraph.

> Sometimes a mob might "grift" all day without "turning them over," but this is unlikely except in the case of a "jub mob" which takes a limited number of "pokes." Any pickpocket who has on his person more than one wallet is something of a hazard both to himself and to the mob, for each wallet can count as a separate offense if he should be caught. Therefore, it is safer to have cash only. "Class mobs" usually count the money each time they "skin the pokes," one stall commonly is responsible for all of it, and an accounting in full is made at the end of the day. When there is a woman with the mob, she usually carries the "knock up" (Maurer, 1955, p. 194).

Were you able to deal effectively with the terminology of the passage, or did you feel like an "outsider" due to your lack of awareness about pickpockets? Outsiders are restricted in their communication with a group whether that group be pickpockets or cricket players because they cannot use the group's special vocabulary and the concepts inherent in that terminology. "Insiders," on the other hand, use special vocabulary freely to communicate with the collective members of a group. The obvious analogy here is that students may be outsiders in the field of science, social studies, or mathematics. At the same time they need to become insiders with the concepts of these subjects, and this can be accomplished, to a large extent, by preteaching them the technical vocabulary of those subjects.

Another case for preteaching the vocabulary of a content area is that "knowing" a word is not an all-or-nothing proposition. Using the example of the term "gold," Anderson and Freebody (1979) pointed out that one would probably feel confident of its meaning and would know how to use the word in ordinary conversation. At the same time, like our pickpocket example, one would not feel so confident about knowing the meaning of gold when in the company of an in-group such as jewelers or metallurgists. Additionally, one probably thinks of gold as a precious metal of a yellowish color. This may not necessarily be true. First, not all gold is a yellowish color. Second, if a mountain of gold were to be discovered, it no longer would be considered precious. Finally (though unlikely), a scientific breakthrough may cause us to redefine what a metal actually is, and it may be discovered that gold is really not a metal. Thus, knowing a word is really defined by the context in which it resides.

This ties directly into how a word will be defined in this chapter. A word is a pattern of auditory or visual symbols which represent schemata, or concepts (Readence, Bean, & Baldwin, 1981). Such a definition implies that word meanings are in an endless stage of flux as the concepts which words represent are being constantly modified by daily experiences. Thus, the task of the content teacher is to preteach the essential vocabulary students will need to activate the appropriate schemata which will enhance their comprehension of the text.

Vocabulary knowledge may be acquired through direct, or firsthand, experience and vicarious, or indirect, experience. Direct experience occurs when students personally experience what they are to learn. Concrete examples are experienced. For

instance, science class students may learn the concept of "refraction" by conducting an experiment with light and glass. This is the best means for getting to know a word and represents the means by which we begin to learn words from an early age.

Vocabulary may also be acquired vicariously through indirect experiences with concepts. This includes learning from films, filmstrips, television, pictures, maps, and other media. For example, the hardships of frontier life in colonial America may be learned through viewing a film on the subject. Whether through direct or indirect experience, teaching vocabulary is an important aspect in prereading activities.

Students do not automatically acquire new concepts and the ability to identify words that represent new concepts on their own. Direct instruction is essential, and almost any kind of instruction is better than none at all (Petty, Herold, & Stoll, 1968). Further evidence for this assertion was provided by Jenkins, Pany, and Schreck (1978) who found that providing the meanings of words, practicing their meanings, and learning meanings from context were all at least somewhat better than no instruction at all for average and below average middle school readers. Therefore, one principle of effective vocabulary instruction is to provide to students direct instruction for potentially troublesome words.

Johnson and Pearson (1978) pointed out two more important principles of effective vocabulary instruction. First, the importance of practice with new words cannot be underestimated. Students should be given an opportunity to use new vocabulary to reinforce their grasp of word meanings. Second, there is no substitute for the enthusiasm teachers can convey about the value of acquiring new vocabulary. Teachers can be effective models for students using the word students are expected to learn.

A final principle of effective vocabulary instruction is eclecticism in teaching. Students learn in a variety of ways; therefore, successful vocabulary instruction calls for a repertoire of activities. In the remainder of this chapter we discuss a number of prereading activities for helping students assimilate new vocabulary. These activities are divided between those that focus on helping students infer the meanings of words by the way they are used in a passage, and those that emphasize categorization of words.

Inferring Word Meanings from Context

Contextual Redefinition

All human experience is dependent upon context. For example, smoking a cigar might be allowed in your home, but it would be inappropriate in a church. Context also is a necessary and natural part of reading and comprehending. Many reading educators (Allington & McGill-Franzen, 1980) stress the importance of using context in verifying and interpreting the meanings of words which, in turn, leads to more effective processing of print. Additionally, the use of context allows readers to make informed guesses about the meaning of words in print and to monitor those guesses by checking them for syntactic and semantic acceptability as reading continues.

Frequently, writers of text provide various direct clues to the meanings of words in sentences. These clues might include the use of synonyms, a description or definition, familiar expressions, or comparison and contrast with other concepts. While it may not be important for students to identify which type of context clue is provided, it is essential that they be able to use these devices to derive meaning. The following teaching strategy, Contextual Redefinition (Cunningham, Cunningham, & Arthur, 1981), provides a format for students to realize the importance of context in ascertaining meaning. Contextual Redefinition is useful when a few difficult terms can be defined by the context in which they occur.

To demonstrate the strategy, write a definition for the following words:

1. VAPID _____

_____

2. LUMMOX _____

_____

3. PIEBALD _____

_____

Were you able to provide a definition from your head for these terms? If not, read the sentences below to see if they help you

define the words. After you write a definition, check a dictionary for the meaning of each term.

1. Even though she intended to discuss a lively issue, her conversation with me was *vapid*, lacking animation and force.
2. As a result of his ungainly, slovenly appearance, Bill was often unjustly labelled as a *lummox*.
3. Though described as *piebald* because of its spotted black and white colors, the horse was still considered beautiful by many horse-lovers.

More than likely, if you did not already know the meanings of the terms, the sentences were helpful in determining the meanings. All "good" readers utilize context, often subconsciously, as a clue to meaning. At the same time, many students who are not efficient readers do not effectively utilize context, particularly when they face new information in subject matter textbooks. Teachers can go a long way in enhancing students' ability to comprehend text by teaching students the use of context and not assuming they already efficiently use the strategy.

Contextual Redefinition entails the following steps:

1. *Select unfamiliar words.* Identify those words students will encounter in text that are central to comprehending important concepts and may present trouble for students as they read.
2. *Write a sentence.* A context for each word should be provided with appropriate clues to the word's meaning. If such a context already exists in the text, use that text sentence in lieu of creating one. In the examples used, clues of definition or description were provided.
3. *Present the words in isolation.* Using a transparency or chalkboard, ask students to provide you with a meaning for each word. Students then defend their guesses and, as a group, come to some consensus as to what they believe is the best meaning. Some guesses may be humorous or even "off-the-wall," but this is part of the process of realizing the importance of context. For example, students might guess that *piebald* has something to do with "hairless pastry" or "bald men with flat, round heads."
4. *Present the words in a sentence.* Using the sentence or short paragraph previously developed, present the word in its appropriate context. Again students

should be asked to offer guesses as to the meaning of each word and to defend their definitions. In this way less able readers will be able to experience the thinking processes involved in deriving a definition from context. In essence students act as models of appropriate reading behavior for one other.

5. *Dictionary verification.* A student, or group of students, then consults a dictionary to verify the guesses offered by class members.

Several benefits can be derived from the use of Contextual Redefinition. First, students should realize that simply guessing the meaning of a word in isolation is frustrating, provides for haphazard guessing, and is probably not very accurate. Second, they should realize the context provides additional clues to the meaning of words which allows them to make more informed guesses. Finally, students become actively involved in discovering the meaning of unknown words rather than just passively remembering lists of vocabulary terms. Through such an activity, it can be seen that students have the potential to independently apply informed guessing through context in other forms of reading.

Possible Sentences

Possible Sentences (Moore & Arthur, 1981) is a combination vocabulary/prediction activity. It is designed to acquaint students with new vocabulary they will encounter in their reading and guide them as they attempt to verify the accuracy of the statements they generate. Additionally, it arouses curiosity concerning the passage to be read. Thus, Possible Sentences is best used when unfamiliar vocabulary is mixed with familiar terminology. Possible Sentences consists of the following steps:

1. List key vocabulary
2. Elicit sentences
3. Read and verify sentences
4. Evaluate sentences
5. Generate new sentences

In describing Possible Sentences, the following example text will be used:

> **Warts Still Defy Spunk Water and More Scientific Cures**
>
> Utter medical humility certainly was displayed by dermatologists at the University of Cincinnati when they announced that after a 20-year

study of warts, they were no nearer finding a satisfactory cure than when they started. Although the scientists concluded that the verrucae are produced by a polyoma virus, a highly contagious carrier, they confessed that they weren't really further advanced than Hippocrates in suggesting reasons for the incidence of warts, or nostrums for their cure. This leaves orthodox doctors with the customary resort only to treatments such as caustic painting, freezing, or electrocautery.

Warts, like love and happiness, tend to come and go at their own volition. Their evanescence has ever made them a target for old wives' charms and autosuggestive cures. And such folk medicine doesn't seem to have progressed any better down the decades than that of the professional practitioners. Pliny the Elder, in the First century A.D., advised afflicted Romans to touch each of their nodules with a pea, wrap the peas in a cloth, and throw the parcel away behind them. The magical theory was the symbolic transference of evil in which the person picking up the package would pick up warts as well.

The popularity of *Tom Sawyer* has led to widespread reliance among rural and verrucose Americans on Tom Sawyer's prescription of sprinkling with "spunk water," rainwater scooped up from a tree stump in the woods. Interestingly, spunk water never existed in the American language until Mark Twain dreamed it up. (Adapted from Ryan, P., *Smithsonian*, 1977, 7, 164.)

In order to determine the key vocabulary, the following concepts are selected as most important:

- Medical science has not been able to find a cure for warts.
- Current treatments consist of caustic painting, freezing, and electrocautery.
- Folk cures for warts have descended through the ages.

1. *List key vocabulary.* In order to lead students to the above concepts, list the following vocabulary on the chalkboard.

Warts	
dermatologists	electrocautery
verrucae	autosuggestive cures
polyoma virus	Pliny the Elder
nostrums	verrucose
caustic painting	spunk water
freezing	Mark Twain

Pronounce each word as it is written on the board. Students may also volunteer words associated with the topic.

2. *Elicit sentences.* Ask students to use at least two words from the list and formulate a sentence using them (a sentence they think might possibly be in the text). Record the sentences verbatim and underline

the words used from the list. Be sure to record the sentences exactly as stated even if the information is not correct. Continue eliciting sentences from students. Students may use words already placed in sentences as long as a new context is created. Cease recording the sentences after a specified period of time or when the students can produce no more.

Below are some sentences that might be elicited using possible sentences:

a. *Freezing* and *electrocautery* are two methods *dermatologists* use to remove warts.
b. Three types of warts are *verrucae, nostrums*, and *verrucose*.
c. *Mark Twain* said to use *spunk water* for removing warts.
d. Three home remedies for removing warts are *spunk water, autosuggestive cures*, and *caustic painting*.
e. *Pliny the Elder* discovered the *polyoma virus*.

3. *Read and verify sentences.* Have students read the text selection for the explicit purpose of verifying the accuracy of their possible sentences.

4. *Evaluate sentences.* After the reading, evaluate each sentence. The text selection may be used as a reference. Evaluate sentences according to their accuracy, and refine or omit those that are not accurate. Such discussion calls for careful reading, and judgments of the accuracy of the generated sentences must be defended. Examining the possible sentences above, sentences "a" and "c" may be accepted as they stand. Sentence "b" will have to be modified because *verrucae* is the only word listed in the sentence that is synonymous with warts. This sentence might be modified to the following: "*Verrucose* people are constantly seeking *nostrums* for the cure of their *verrucae*." Sentence "d" can be easily modified by dropping out "caustic painting" as a home cure since it is a remedy used by dermatologists. Finally, sentence "e" has to be modified since "Pliny the Elder" did not discover the "polyoma virus." It could be modified as follows: "*Pliny the Elder*, unaware that warts are caused by the *polyoma virus*, suggested a folk remedy for getting rid of warts."

5. *Generate new sentences.* After the evaluation and modification of the original sentences are accomplished, ask for new sentences. New sentences are generated with the intent of extending student understanding of the text concepts. As these sentences are dictated, have students check them for accuracy, using the text selection for confirmation. All final acceptable sentences should be recorded by the students in their notebooks.

Possible Sentences provides students an opportunity to practice their language skills. Using their experiential background, students think of possible associations new vocabulary terms may have and evaluate them. They speak to express their associations and listen to others' thoughts and associations. Finally, they read to verify the possible combinations. Thus, students are actively involved in new learning. Additionally, teachers can see the degree of prior knowledge students possess on a particular topic and how well students are able to modify that knowledge upon reading the text.

Categorizing Words

Whether using Possible Sentences, Contextual Redefinition, or any other strategy designed to preteach vocabulary, context serves as the vehicle for verifying tentative guesses about the meanings of unknown words. However, context, while determining meaning, may not always reveal it (Deighton, 1959; Johnson & Pearson, 1978). Therefore, teachers need to tell their students the meanings of important vocabulary terms when the context is anomalous.

While, at first thought, this may not seem desirable, it must be emphasized that we are not suggesting that telling students the meaning of unknown words means just providing short definitions or synonyms for them. Certainly, a study of words in this way is a very narrow approach to vocabulary development because it neglects important relationships that add depth to word meanings, and it denies the value of direct and vicarious learning.

Rather, what we are advocating when we say to tell students the meanings of new vocabulary is a systematic teaching strategy to develop concepts based on students' existing conceptual framework. In particular, procedures to teach word concepts developed by Frayer, Frederick, and Klausmeier (1969) and Taba (1967) deserve consideration.

Frayer, Frederick, and Klausmeier Procedure

This procedure is based on the idea that to teach for mastery of word concepts, knowledge of other word concepts is essential. Thus, the procedure is based on the idea of associating the new to the known. In particular, it advocates the use of supraordinate, coordinate, and subordinate aspects of concepts in addition to stressing relevant attributes of new words (Thelan, 1982).

Before proceeding to an example of this strategy, definitions of the terms mentioned above are necessary. A supraordinate term is a word which denotes a common, more general class of which the target word is a member. For example, *compound* is a supraordinate term for the target word, *water*. Coordinate terms are words which refer to members of the same general class of terms. Thus, *salt* and CO_2 are coordinate terms for *water*. A subordinate term is a word which includes specific features of the encompassing, general term, but is of a lower classification. For instance, *snow* and *ice* are subordinate terms for *water*. Finally, relevant attributes are those features which characterize the target word. Thus, *contains hydrogen and oxygen* and *makes up most body weight* are relevant attributes of *water*.

Below is an example of this classification procedure using the math term, *quadrilateral*, which a teacher deems essential to understanding relevant text material.

Supraordinate Term		Polygon	
Coordinate Terms	Quadrilateral	Triangle	Pentagon
Relevant Attributes	1) Four-sided 2) Closed figure 3) Made up of line segments		
Subordinate Terms	Trapezoid	Parallelogram	Square

In presenting this to students, attempt to actively involve them in developing this framework. Thus, discovery learning is very much a part of using this strategy. The more the teacher involves students in naming terms in the resulting framework, the better the learning should be. For example, in teaching the concept, *quadrilateral*, the teacher should provide the supraordinate term, *polygon*, and proceed to ask students to name other coordinate terms, or members of the *polygon*

class. Obviously, other coordinate terms such as *hexagon* or *octagon* could be supplied in addition to those shown in the example.

Next, ask students to identify relevant attributes of a *quadrilateral*. Questions to ask might be, "What is special about a quadrilateral?" or "How is a quadrilateral different from other polygons?" In this way students should name those features which distinguish a *quadrilateral* from a *triangle* or *pentagon*. This phase of the procedure is essential as it helps students identify not only what a *quadrilateral* shape is but, also, what it is not. Thus, a *triangle* is not a *quadrilateral* as it is three-sided. Illustrations also could be used to obtain relevant attributes. For instance, is a *quadrilateral* because it is four-sided, a closed figure, and made up of line segments; however, is not a *quadrilateral* because it is not closed; and is not a *quadrilateral* because it is not composed of line segments (straight lines).

Finally, the teacher can attempt to have students provide subordinate terms, or examples, of *quadrilateral*. In addition to the terms used in the example, students might suggest *rhombus*. If students are unable to provide these terms, the teacher can do so and can assess students' understanding of the concept, *quadrilateral*, by having them explain why a *parallelogram* is a *quadrilateral*.

This strategy presents students with varied ways of thinking about the meanings of new words. Because of its systematic method, this strategy offers students the opportunity to see how new concepts relate to other concepts and how discussing what a word does and does not represent enhances vocabulary development.

List-Group-Label

The List-Group-Label lesson was originally conceived by Taba (1967) as a vocabulary development activity in social studies and science classes. Like the Frayer, Frederick, and Klausmeier Procedure, it is based upon the use of categorization as a way to help students organize verbal concepts. Thus, List-Group-Label is most appropriate when much of the vocabulary is familiar.

Briefly, the lesson begins with the teacher supplying students with a stimulus topic drawn from their experiences or from the materials they are studying. Next, students develop a list of words or expressions they associate with the stimulus.

When using this activity, it will be seen that a spiraling effect occurs, i.e., initial associations to the stimulus promote more associations by other students. These associations are recorded by the teacher until the list totals approximately 25-30 words. The students next construct smaller lists of words from the large list and provide a label for each grouping. Approximately three to five words are placed in the smaller groups, and students then verbalize why they have grouped words in a particular manner.

When used as a prereading strategy, the List-Group-Label lesson can effectively activate students' content knowledge, thereby enhancing comprehension. To exemplify its use as a prereading activity in the content areas, the stimulus topic "geometry" will be demonstrated as actually used in a seventh grade math class. The students were briefly introduced to geometry in the sixth grade, but the seventh grade curriculum called for a lengthier study of that area. To reinforce the unit, the teacher used the format of the List-Group-Label lesson. The students generated the following list of words.

Stimulus Topic: Geometry

square	rectangle
cubic centimeters	triangular prism
math	base
volume	side
area	cylinder
cube	prism
pyramid	face
cone	edge
sphere	corner
symmetry	congruence
ruler	surface
protractor	compass
square inches	circle
equilateral triangle	

The students next made smaller groups of words from the list and then labeled them. Following are examples of these groups:

Geometry Groups

1. Protractor, ruler, compass = measurement tools.
2. Sphere, cone, circle, cylinder = curved surfaces.
3. Square inches, volume, area, cubic centimeters = forms of measurements.

4. Cylinder, cone, prism, cube, pyramid, square = things that have faces.
5. Prism, cone, cube, triangular prism = space figures.
6. Square, sphere, corner, volume, circle = words with six letters.
7. Side, symmetry, square, square inches, surface = words beginning with *s*.

As can be seen, the majority of the groups are based on meaningful, semantic associations. It should be noted, however, that the last two groupings are based on surface level, spelling cues rather than semantic cues. This is not the desired outcome of the List-Group-Label lesson even though such associations might serve as important mnemonic devices for some students as they deal with the text material. The purpose of this lesson is to stimulate meaningful word associations, thereby activating students' backgrounds prior to reading a passage.

Additional Comments on Preteaching Vocabulary

The activities for teaching vocabulary suggested in this section focus on two general approaches: 1) inferring the meanings of words by noting the way they are used in a passage, and 2) noting the connections among topic words with related words. These certainly are not the only two avenues toward emphasizing vocabulary prior to assigning a reading passage. However, these methods complement the ones suggested in the earlier chapters of this monograph because they are designed to motivate students to read, activate content knowledge, and focus attention on specific information. In addition, they are workable, efficient procedures which content area teachers can employ readily in their classrooms. For a more complete view of methods for teaching meaning vocabulary, see *Techniques of Teaching Vocabulary* by Dale, O'Rourke, and Bamman (1971).

Moreover, we purposely omitted specific suggestions for teaching concepts through direct and indirect experiences. There is general agreement that the best way for students to learn the meaning of a term such as *cotyledon* is to plant a seed and then examine the first leaf or pair of leaves that emerge. If providing such direct experience is not possible, then indirectly

experiencing cotyledons by seeing pictures of them and labeling them in diagrams is certainly worthwhile. Similarly, the meaning of *sonnet* seems to be understood best when students have read several of them and attempted to write a few. The main reason we omitted specific suggestions for teaching concepts through direct and indirect experiences is because such an undertaking belongs more in a treatment of specific content areas. Methods texts in social studies, physical and biological sciences, vocational arts, mathematics, and English suggest numerous direct and indirect experiences which students realistically can have with the particulars of their discipline. We encourage you to provide many of those suggested experiences prior to reading a difficult passage rather than only afterwards. Sometimes the horse and the cart become confused.

Summary

This chapter has presented a rationale for preteaching vocabulary and some principles essential to effective vocabulary development. Four strategies have been presented to aid teachers in developing students' vocabularies. Contextual Redefinition can be used when a few words can be defined by the context in which they occur. Possible Sentences is appropriate when unfamiliar vocabulary is mixed with familiar terminology so students can attempt to associate new information with known information. When context doesn't work, two activities were advocated for teaching new vocabulary using concept development models. Finally, we stressed the importance of providing students direct and indirect experiences with concepts prior to reading about them.

The importance of such direct instruction in vocabulary development cannot be overemphasized. Additionally, using strategies which actively involve students in discovering the meaning of new words is essential.

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Chapter Five

Previewing Graphically Represented Information

In this chapter we present techniques for preparing students for a passage by graphically representing the information to be read. Graphic representations of information such as outlines and graphic organizers depict relationships among concepts so that students, in effect, have a map of an upcoming passage. Outlines and graphic organizers reflect the organization of textual material. Because graphically representing information through these techniques provides a framework for a passage, students are able to foresee what is ahead. They learn what to expect as they read. In this way, information can be assimilated more readily than if students simply were thrust into a passage.

Outline

The outline has been a common educational tool for years. In an outline, major concepts and pertinent details are hierarchically organized. This strategy is used quite frequently in many content classrooms to impose a written structure on term papers and as a means to study for tests. It is also suggested by teachers as a way to group notes into a framework.

Some research evidence indicates that outlines presented before a reading task facilitate student comprehension. Glynn and DiVesta (1977) found that when outlines were used as a prereading technique by teachers to familiarize students with new material, factual recall was significantly improved. In an earlier study, Proger, Taylor, Mann, Coulson, and Bayuk (1970) found that when sentence outlines were used as prereading strategies the retention of specific conceptual information was enhanced. Thus, when utilized *before* reading,

outlining may enhance readiness for integrating concepts into existing knowledge. Outlining has the potential to be an efficient vehicle for promoting learning when used before the information is presented in text and when teachers maintain responsibility for its construction.

An example of an outline which could be used in a home economics class on the topic of fibers might look like this:

Fibers

I. Natural
   A. Vegetable
      1. Cotton
      2. Linen
   B. Animal
      1. Wool
      2. Silk
II. Man-made
   A. Chemical
      1. Acrylic
      2. Rayon
      3. Nylon
      4. Polyester
      5. Acetate

In presenting the outline to a class, the teacher could use an overhead projector and some form of a mask. As each new element of the outline is unmasked, the teacher should clarify unclear points and encourage discussion to assess prior knowledge. In this manner, the organization of the text will become apparent through the gradual building of the text structure in outline form.

It is cautioned that the use of outlines should be restricted to texts which are arranged in an ordered format where general concepts are sequentially introduced and supported with appropriate detail. Texts which do not necessarily follow such an organized format would be poor candidates for this strategy. When such a clear "picture" of the interaction between major concepts and subsuming details is not apparent (i.e., when the text is loosely organized), a graphic organizer probably would be more useful.

Graphic Organizer

The graphic organizer (Barron & Earle, 1973) presents a schematic diagram of major concepts and additional terms which convey the text structure to students before they read.

This strategy is easily adaptable to many content subjects (Earle, 1976; Thelen, 1976; Lunstrum & Taylor, 1978). It can also serve as a point of reference when students begin to read and study in detail (Tierney, Readence, & Dishner, 1980). Relationships between major concepts are organized, and students are provided a clear picture of the text. Following are steps used in the construction of a graphic organizer:

Step One The major objectives and concepts of the lesson to be taught are identified. The following concepts and terms were identified from a chapter on "Fibers" in *Steps in Clothing Skill* (Draper & Bailey, 1978):

Key Concepts

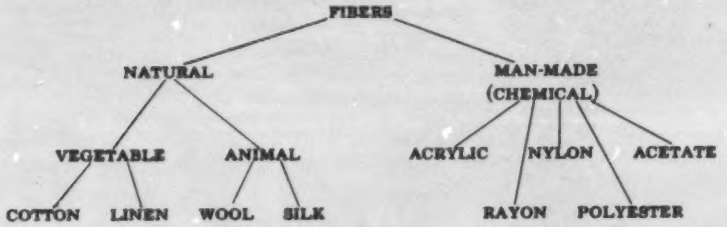
1. Fibers can be either natural or man-made.
2. Natural fibers can be obtained from animals or vegetables; man-made fibers are chemically produced.
3. Examples of natural fibers are cotton, linen, wool, and silk.
4. Examples of man-made fibers are acrylic, rayon, nylon, polyester, and acetate.

Key Terms

fiber	acrylic	silkworm
yarn	nylon	cocoon
fabric	acetate	man-made fibers
cotton	linen	rayon
flax	wool	polyester

Step Two The key terms are arranged into a picture, or diagram, which parallels the text structure, stressing relationships between and among terms. Depicting text relationships may be considered as one advantage of the graphic organizer over an outline. The structure of the graphic organizer can take many shapes, and additional terms beyond those found in the passage can be included. There is no "correct" way to organize the terms. This depends on the teacher, the arrangement and organization of the text, and the students' back-

ground knowledge. One appropriate diagram of our example could be the following:



Several different illustrations could be made to determine the "best fit" for different classes of students. Lower-ability students might require a very simple diagram, whereas higher-ability students may be able to infer relationships better and require fewer examples.

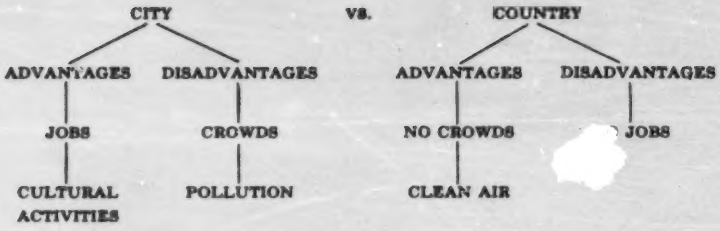
Step Three The graphic organizer is presented to the class. While a chalkboard or ditto sheet may be used, it is recommended that an overhead transparency be utilized. Smith (1979) advised that the diagram be unfolded gradually to promote active student involvement. The teacher talks students through the diagram, explaining any unclear relationships and encouraging discussion of key points. Each section of the organizer is presented and discussed until the completely developed structure is displayed. After discussion, the diagram can be left in view for use as a reference point during silent reading and subsequent discussion.

Variations

There are many different patterns an advance organizer can take, including the following:

1. Cause-Effect
2. Comparison/Contrast
3. Time Order
4. Simple Listing
5. Problem-Solution

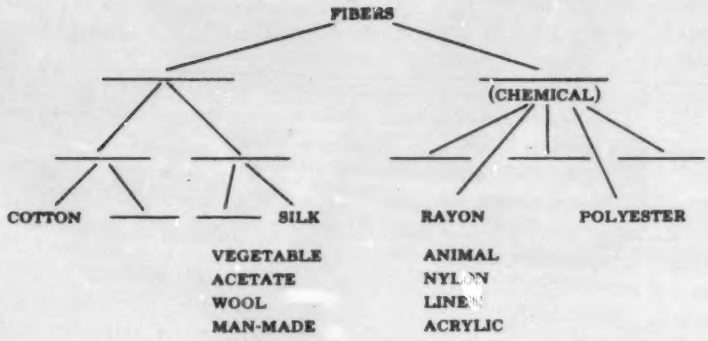
An example of a comparison/contrast graphic organizer is provided (Readence, Bean, & Baldwin, 1981, p. 135):



The graphic organizer also can be used by students when surveying the text (see Chapter 2). An incomplete diagram is displayed and students are told which pattern of organization the author has used. The students then survey the chapter in order to fill in the missing sections of the organizer. Having students copy each term on index cards allows them to readily manipulate the organizer. As students become familiar with text patterns and the graphic organizer, they can be encouraged to survey text chapters independently and produce original diagrams. These can then be compared in small groups, with students defending their reasoning for choices made. Again, students should be cautioned that there is no one "correct" solution as long as the graphic organizer adequately depicts the development and relationships between major concepts.

The idea of using an incomplete diagram and surveying the text can also be used with outlines. Students would rely on headings and subheadings in the text to fill in the incomplete outline form. Students must be able to follow the sequential development of the text in order to decide which terms fit most appropriately into the blanks. Unlike the graphic organizer, however, only a limited number of terms would properly fit each blank in the incomplete outline because of the more organized text format.

Finally, after students read the text, a graphic post-organizer or outline can be used. Readence and Moore (1979) suggested that the same diagram used to enhance readiness in the prereading stage can be used to aid in the recall of material after reading. For instance, blanks can be left in the original diagram for students to fill in by recalling the organization of the new text material learned during silent reading. Deleted words are listed underneath the diagram in random order. A graphic post-organizer for our "Fibers" chapter might look like this:



Students either recall or locate appropriate terms and concepts in order to complete the diagram. This form could be put on a ditto sheet and used as a quiz or as an additional device for instruction.

Visual Reading Guide

Stein (1978) offered the Visual Reading Guide (VRG) as another approach for introducing students to a passage through graphically represented information. The VRG uses the visuals (tables, graphs, charts, pictures) contained in a text chapter as a previewing device for students. The teacher identifies visuals which depict major concepts to be encountered in the reading. Students analyze each visual and ascertain what each one is depicting. Students should form some type of main idea statement about the visual and cite supporting evidence for their statements. Through questioning and discussion, students are led to a consensus as to what information is portrayed by the visual. Often the visual will have a heading or explanation guiding student responses. To increase student generation of ideas, the teacher may display the visual without its heading and ask students to supply whatever information they can. By proceeding through appropriately designated visuals, students, with teacher aid, should be able to learn what to expect in a passage and become prepared to learn the important concepts.

Summary

Three techniques presented in this chapter graphically represent major concepts contained in a passage. When

organized by the teacher and used before reading, the outline can be an effective tool to aid student recall. Additionally, the graphic organizer gives the students a preview of the text and graphically depicts relationships among major concepts and terms. It is probably best used when the text concepts are more loosely organized. The Visual Reading Guide highlights pictorial aids contained in a passage which yield information about that passage. All three techniques can be used in all subject areas. With the availability of these techniques for classroom use, comprehension and learning can be enhanced for all students.

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Chapter Six

Selecting Prereading Activities

In Chapter One, we presented five characteristics of student readiness for reading (motivation, content knowledge, word knowledge, learning strategies, and attention) that content area teachers can address directly. Chapters Two through Five then described activities that focus on those aspects in varying degrees. This chapter suggests considerations to be made in order to select prereading, readiness activities that are most appropriate for particular teaching situations.

Stated simply, different activities are designed to produce different outcomes. That is why we described a variety of prereading, readiness techniques. For example, Possible Sentences is designed primarily to enhance reader understanding of the relationships among key vocabulary, but Anticipation Guides is designed more to enhance reader understanding of underlying principles and themes. Prereading questions focus attention on particular portions of a text and can lead students to elaborate the information, while graphic organizers emphasize relationships throughout a passage. Because of these differences, it is important to be selective while choosing prereading activities.

This chapter describes four factors to consider while selecting a specific reading readiness activity for students. These factors include characteristics of learners, reading materials, expected learning outcomes, and the learning activities themselves. Recently, these factors have been discussed in regard to research activities (Bransford, 1979), but their application to instructional decision-making seems apparent and will be discussed in that context.

The four factors to consider during reading lesson planning are interdependent. For instance, if your students are well prepared for a passage, if the passage is written at an appropriate level of difficulty, if feasible learning outcomes

have been identified, and if an activity that efficiently directs students toward those outcomes has been selected, then learning can be expected. However, if one of the factors is fixed but not optimal (available reading materials might be quite difficult for your class) then adjustments in the characteristics of your students, your expected outcomes, or your learning activity are required in order to obtain maximum comprehension and learning.

Because the four factors described in reading lesson planning interact, you cannot isolate one and then another while planning lessons. The factors need to be considered simultaneously. After all, you can't answer the question, "Is the textbook difficult?" without knowing the potential readers. The textbook may be difficult for some but not for others. Thus, decisions in planning are relative. However, for purposes of discussion we need to present the factors individually. Accordingly, the following discussion presents individually the four factors to consider when planning prereading, readiness activities.

Characteristics of Learners

The five aspects of readiness to read described earlier provide guidelines for assessing the characteristics of the learners you have in your classes. As we indicated, these are the things that can be directly addressed during instruction. First, you can determine students' levels of motivation. This can be done readily by observing how students react to your previous lessons. Do you need to convince them that studying the Middle Ages is worthwhile and relevant, or are they convinced already? The question to ask yourself is how much is needed to arouse students' curiosity and stimulate them to become involved in reading content-related materials. This question is especially important for those who work with middle school and senior high students because learning often reflects motivation. Many decisions about materials, learning outcomes, and activities are based on this key factor.

Second, determining the content knowledge your students already possess is crucial during lesson planning. Launching students into a chapter of the class textbook or other reading material typically needs to be postponed until they get a feel for

the topic. Students who are not aware that sound travels in waves through the air will have difficulty understanding a passage that describes how Edison first recorded sounds on his phonograph. But as we have pointed out, content knowledge can be developed through direct or indirect experiences in order to prepare students for what they read.

Third, word knowledge also helps describe learners' characteristics in relation to a particular reading task. Determining how much help students will require to identify the words in a passage in order to learn its important information is essential. Some words are more difficult than others to identify regardless of the concepts which they represent. Depending on their backgrounds, your students may or may not require help with identifying the words of a passage. *Hemoglobin* is a term that occurs infrequently in general materials, but it may be a term that you have been using for the past few weeks during a unit on the circulatory system. Because of this, you probably would not neet to spend much, if any, time with it as you prepare students for an upcoming, end-of-unit reading assignment. On the other hand, *hemoglobin* may have required a good deal of emphasis when your class first encountered it.

Fourth, learners require appropriate strategies in order to learn from particular passages. Anticipating, elaborating, and organizing information are essential learning strategies. As you look over the demands of an upcoming passage, you can determine which strategies your students most likely will need to apply in order to learn the important information. Then you can help them apply the strategies at appropriate points. All of the activities described in this monograph are designed to help students anticipate information, but then some were more specific. For instance, the questioning and forecasting techniques emphasize elaboration of information, while the graphic representations focus on organizing information.

Finally, learners' attention to important information is an important characteristic. As we pointed out in Chapter Two, either you or your students can be the ones to focus attention to particular parts of a text. Teachers traditionally are the ones who set purposes for reading and thereby focus attention, but this traditional practice denies students the opportunity to set their own purposes for reading. Activities such as DRTA and surveying allow students to assume this responsibility.

Characteristics of Reading Materials

The reading materials that you have available to present specific content play a major role in your decision about appropriate prereading activities. While planning lessons, you can inspect three major characteristics of text materials that contribute to their reading difficulty: individual concepts, relations among concepts, and adjunct aids.

Individual Concepts

Individual concepts refer to those concepts, or ideas, that are represented in a passage by a single word or short phrase. The "vocabulary" of a passage generally is equivalent to the individual concepts. The difference is when one basic concept is represented by two or more terms. For example, "survival of the fittest," "supply and demand," and "revolution of rising expectations" each refer to individual concepts even though they are phrases and not individual words.

When we refer here to individual concepts, we also mean individual, subordinate concepts. These differ from individual, supraordinate concepts. For example, a passage may contain a discussion of dinosaurs' appearance, types, era, and reasons for extinction. "Dinosaur" would be a supraordinate, or higher, concept in this case because all the points in the passage are related to it. On the other hand, "dinosaur" could be a subordinate, or lower, concept in a passage that is devoted primarily to describing features of reptiles. In such a passage, alligators, crocodiles, snakes, and lizards—as well as dinosaurs—might be mentioned as examples of forms of reptiles. Thus, "dinosaur" would be a subordinate concept. In this section, we are referring to individual concepts that are subordinate to larger, encompassing ideas contained in a passage.

It is no surprise that some materials present individual concepts that are more difficult than others. Some science books present erosion and tides, while others present heliozoans and interoceptors. What can be surprising is the differences in clarity with which different materials present their individual concepts. As you plan lessons, you can vary them according to the degree of clarity found in the reading materials' presentation of individual concepts.

Well-written materials provide specific, clear explanations of new ideas. After introducing a term such as *condensation* in a section on the supraordinate concept, "weather," a well-written science text might briefly state that in condensation a gas or vapor loses heat, decreases in volume, and turns into a solid or liquid. Contrasting condensation with evaporation would be appropriate. Comparing *Readers Digest* condensed books with their originals would demonstrate part of this term's meaning. And pointing out products of condensation such as the sweat on glasses of ice water, breath that forms moisture on cold window panes, clouds, rain, frost, and snow would do much to clarify that concept. This way of providing several concrete examples to elucidate an abstract concept contributes greatly to the comprehensibility of materials.

Quite often, new vocabulary is presented in a text with a cursory explanation because authors assume that their readers will have appropriate background to understand the new terms. Books which define condensation by stating that it "involves uniting molecules to form new, heavier, and more complex compounds" may help advanced science students grasp that concept; however, beginning science students would probably still be wondering what condensation is. Furthermore, authors may introduce several individual concepts on each page of text because they believe that their readers can handle such rapid movement through a topic. But again, readers' maturity, prior knowledge, and reading ability determine whether they can handle the pace with which concepts are presented. While planning lessons, the degree to which new, individual concepts are explained needs to be considered.

Relationships among Individual Concepts

Identifying the subordinate, individual concepts and determining how clearly they are explained is one way to analyze the characteristics of materials. Another way to analyze materials is to assess the clarity of the relationships among those concepts. In other words, you can determine how clearly the supraordinate ideas are presented. To do this, simple basic questions can be asked such as "How well organized is this material?" "Will my students be able to follow it?" Indeed, Tierney, Mosenthal, and Kantor (1980) suggest

that you can judge the clarity of the relationships among concepts on the basis of how easily you can outline and describe them.

Relationships in a social studies text might encompass several individual subordinate concepts. For example, in order to describe the origin of the Mason-Dixon Line, a passage might include the concepts "Maryland," "colonization," "boundary dispute," "Charles Mason," "Jeremiah Dixon," "1763," "the Union," and "the Confederacy." Not only would you determine how much help your students would require in order to understand those individual concepts, you would also judge what would be needed to help your students follow the connection among them. With regard to this, the passage may or may not explicitly state that it is describing the origin of the Mason-Dixon Line (the supraordinate concept). The Pennsylvania-Maryland boundary dispute during colonial times, which was the impetus for the line, may or may not be explicitly linked with Charles Mason and Jeremiah Dixon's arrival in 1763 to map the border. And finally, the relationship of the intangible Mason-Dixon Line to the real differences between the Union and the Confederacy may or may not be clearly stated. In short, the clarity with which a passage explains concepts and relationships among concepts contributes heavily to the difficulty of a passage.

Adjunct Aids

The quality of the adjunct aids included in printed materials also plays an important role in the comprehensibility of text. Adjunct aids consist of parts of texts such as the questions and activities inserted in a chapter or located at the end of a chapter; typographical aids such as bold-faced headings, subheadings, and marked words; pictorial aids such as pictures, illustrations, diagrams, maps, tables, and graphs; glossaries and footnotes; and introductions and summaries. These pieces of text are adjunct because they either highlight or complete the meaning of the main body of the text. They are not the principal elements of a passage, but they are designed to lead readers to the principal elements.

Many of the textbooks being published currently have improved the quality of their adjunct aids. Their aids occur frequently and are focused at the major pieces of content to be learned. The questions and activities included in many current texts encourage students to elaborate the concepts just

presented. And the pictorial aids supplement specific text information rather than merely decorate the page.

During lesson planning, examine the clarity and the comprehensibility of the reading material which you intend to present to your class. Examining how the material presents its individual concepts and the relationships among its concepts, and inspecting its adjunct aids allows you to determine what your students will require in order to learn from that material. To be sure, there are factors such as sentence complexity and paragraph cohesion that also affect the difficulty of a text, but the three factors described are quite powerful determinants. Furthermore, you can directly address these factors as you plan lessons. That is, if the concepts, the organization of concepts, and the adjunct aids are not clear, then you can design prereading activities that serve to clarify them.

Expected Learning Outcomes

In order to select or design appropriate prereading activities, the understandings which students are expected to gain from a passage need to be specified. Just as you assess characteristics of your students and your materials while planning lessons, you can also assess characteristics of your expected learning outcomes. In order to do this, first set out very clearly the objectives which you want your students to reach after reading a passage. Content area teachers have a curriculum of ideas either stated explicitly or held in their mind. This curriculum consists of the concepts, principles, and attitudes which students are expected to acquire from their study of a particular subject. After identifying the parts of the curriculum which you want your students to obtain from a passage, it is important to determine how much help they will need. Making this determination is sometimes more difficult than you may think.

Teachers often believe that information is clearly stated in a given text when, in fact, that information is only mentioned indirectly. This occurs because content area teachers know their discipline so well that the mere mention of a concept triggers their entire, thorough knowledge of that concept. Unfortunately, the same mere mention of that concept may trigger practically nothing in students' minds. For instance, a science text might mention that Darwin's theories changed mankind's view of the world as fundamentally as did Copernicus' theory of the universe. This information might

convey to you a clear perspective on Darwin, but it might do nothing for your students. They simply may not know about the Copernican revolution. Because of this, asking students at a later date to assess Darwin's impact on Western thought becomes a difficult task. Stated simply, you need to read materials with the eyes and the mind of a student in order to decide what information can be reasonably obtained from those materials. Learning outcomes need to be matched with what the text actually offers, not with what it is assumed to offer.

Along the same line, you can assess learning outcomes according to the apparent function of a text. It is important to assess reading objectives according to the information that a passage actually contains, and it is also important to fit objectives with the purposes the author apparently had in mind while writing a passage. For instance, asking students twenty-five literal level questions about Rudyard Kipling's *The Elephant's Child* seems to go against the function Kipling apparently had in mind while writing that story. *The Elephant's Child* contains rhythmic language, high-sounding words, and rich imagery. It was meant to be enjoyed. Having young students answer trivial questions such as "When the elephant's child returned from the Limpopo River, where did he throw his hairy uncle, the Baboon?" subverts the intended function of that passage. After reading an informative article such as a passage about the human heart, students may be held responsible for identifying the auricles, ventricles, arteries, and veins represented by a diagram of a heart. Knowing the location of these components may be appropriate if the passage clearly emphasizes them. However, the passage may emphasize only general notions about how the heart acts as a pump and how it works harder when people work harder. Having students identify a heart's components after reading that passage may be inappropriate because the passage stressed other information. If the curriculum calls for students to be able to locate parts of a human heart, then materials that emphasize those parts are needed. Authors have reasons for writing a passage just as readers have reasons for reading it. Expected learning outcomes should be assessed to see whether those reasons are compatible.

After setting learning outcomes that fit the materials, the next step is to inspect the strategies which those outcomes call for. Are students primarily to learn new vocabulary? Are they to organize a mass of new facts? Are they to compare one

phenomenon with another? Students read every passage for different reasons, and different combinations of strategies are required. Thus, in order to select or design activities that most effectively guide students, you need a clear understanding of what you want your students to be able to do. After all, one activity may direct students' attention to specific details, but the objective may be to provide a general overview. Another activity may stress students' independence, but the intention may be to lead a class directly through a passage because it contains crucial information but is not especially well written. Clearly, determining the nature of the desired outcome is an important factor in selecting or designing prereading activities.

Characteristics of Learning Activities

Once you have determined your goal or expected outcome, have chosen your materials, and know the characteristics of your students, the next step is to select or design a suitable prereading activity. To make a good choice, you must understand how activities are constructed and how they can be modified to meet a particular need.

As an example of altering your approach to suit the circumstances, consider a passage containing important, but unfamiliar, technical words. If there are many new words and they are adequately defined by their context, Contextual Redefinition may be appropriate. If there are not very many new words and your students are somewhat familiar with the subject, a Possible Sentences activity might be useful. If there are a great many inadequately defined new terms, the best approach may be to tell the students directly what they mean and discuss them, using any available audiovisual aids.

On the other hand, if your aim is to help students understand passage structure, other activities such as outlining and use of graphic organizers are more appropriate. In short, it is essential to identify the aspect of prose comprehension on which you intend to focus students' attention. Once you understand your goal, your materials, and your students, you can select an activity that meets your needs.

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